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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 10/693,012  
Filing Date: October 24, 2003  
Appellant(s): TOY ET AL.

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Jessica H. Kwak  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 8/31/2009 appealing from the Office action mailed 3/30/2009.

**(1) Real Party in Interest**

A statement identifying by name the real party in interest is contained in the brief.

**(2) Related Appeals and Interferences**

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**(3) Status of Claims**

The statement of the status of claims contained in the brief is correct.

**(4) Status of Amendments After Final**

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

**(5) Summary of Claimed Subject Matter**

The summary of claimed subject matter contained in the brief is correct.

**(6) Grounds of Rejection to be Reviewed on Appeal**

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

**(7) Claims Appendix**

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(8) Evidence Relied Upon**

6,055,168	Kotowski et al.	4-2000
2003/0065370	Lebel et al.	4-2003

### **(9) Grounds of Rejection**

The following ground(s) of rejection are applicable to the appealed claims:

Rejection of independent claims 1, 18, 35, 51, 60, 62, and 64 under 35 U.S.C. § 103(a) in view of Kotowski and Lebel.

<b>Claim</b>	<b>Limitation</b>	<b>Teaching</b>	<b>Motivation to combine</b>
1	A programmer for a medical device, the programmer comprising:	Lebel teaches a programming device for a medical device shown generally in Figure 3 as element 32.	
	A wireless telemetry circuit adapted to communicate with the medical device;	Lebel teaches a telemetry circuit in Figure 3 as element 56.	
	A boost converter adapted to convert a battery voltage to an operating voltage for the programmer; and	Lebel teaches a boost converter for the system at par. 0235.	
	A control circuit adapted to inhibit pulse skipping by the boost converter when a level of the battery voltage is greater than a threshold voltage.	Kotowski teaches a boost converter circuit generally in Figure 3. Kotowski further discloses that the converter inhibits pulse skipping when a level of the battery voltage is greater than a threshold voltage at col. 3, line 20 to col. 4, line 8.	Providing a boost converter such as Kotowski's to a device such as Lebel's allows low voltage off-the-shelf batteries to be used in applications requiring small size and higher voltages for operation.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 1-10, 12-27, 29-43, 45-51, and 53-69 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kotowski et al. (US 6,055,168, hereinafter "Kotowski") in view of Lebel. Kotowski discloses the essential features of the claimed invention including the following:

In regards to claims 1, 3, 10, 14, 16, 18, 20, 27, 31, 33, 35, 37, 43, 47, 49, 51, 55, 57, 59, 60, 62, and 64, Kotowski discloses a boost converter to convert a battery voltage to an operating voltage and a control circuit to inhibit pulse skipping by the boost converter when a level of the battery voltage is greater than a threshold voltage (col. 3, line 19-col. 4, line 8). Since the input (battery) voltage is used to select the gain based on a number of thresholds (col. 3, lines 51-65), and the gain is used to inhibit pulse skipping, the disclosed pulse skipping is inhibited when a level of the battery voltage exceeds some arbitrary threshold voltage. Kotowski further discloses that pulse skipping is activated when the operating voltage exceeds a threshold and the boost converter is a fixed frequency switching mode boost converter (col. 3, line 30).

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Kotowski does not disclose that this voltage converter is used in a handheld programmer having an internal antenna in combination with a neurostimulator. Lebel teaches of a handheld programmer having an internal antenna in combination with a neurostimulator that utilizes a boost converter, such as the one disclosed by Kotowski, to efficiently provide the voltages needed to operate a device that is small and utilizes off-the-shelf batteries. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Kotowski's invention by providing the voltage converter to a handheld programmer having an internal antenna in combination with a neurostimulator that utilizes a boost converter to provide the predictable results of efficiently providing the voltages needed to operate a device that is small and utilizes off-the-shelf batteries.

In regards to claims 2, 19, and 36, the boost converter activates pulse skipping when the operating voltage exceeds a threshold (col. 3, line 30).

In regards to claim 4, 21, 38, 63, and 65, a transistor couples the battery to the boost converter (Fig. 5, element 10). Because the battery voltage enforces the minimum gain, which is determined by the transistor-based switching of 10, Kotowski meets the claim language.

In regards to claims 13, 30, 46, and 54, pulse skipping is inhibited by limiting the level of the battery voltage applied to the boost converter (by switching per Fig. 5).

In regards to claims 5-9, 22-26, 39-42, and 61, Kotowski's modified invention including modifying the voltage supplied to the boost converter based on the battery

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voltage, but does not disclose a comparator to actuate the transistor, or that the transistor is a MOSFET/MOSFET pair that transmits the battery voltage less a body diode/resistor voltage/external diode drop to the boost converter. It is well known in the electronic arts to utilize comparators to determine when values exceed thresholds with common off-the-shelf parts and to utilize MOSFET/MOSFET pairs that transmit the battery voltage less a body diode/resistor voltage/external diode drop to provide reliable switching with common off-the-shelf parts. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Kotowski's invention by providing a comparator to provide the predictable result of determining when the input value exceeds a threshold with common off-the-shelf parts and to utilize a MOSFET/MOSFET pair that transmits the battery voltage less a body diode/resistor voltage/external diode drop to provide the predictable result of providing reliable switching with common off-the-shelf parts.

In regards to claims 15, 32, 48, and 56, Kotowski discloses the essential features of the claimed invention including modifying the gain of the boost converter based on the battery voltage (col. 3, line 60), but does not explicitly disclose utilizing two or more AA, AAA, C, or D batteries. However, it is well known in the art to provide portable devices with two or more AA, AAA, C, or D batteries to power various devices with readily available power sources. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to further modify Kotowski's invention by providing the device with two or more AA, AAA, C, or D batteries to provide the predictable result of powering various devices with readily available power sources.

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In regards to claims 12, 17, 29, 34, 45, 50, 53, and 58, Kotowski's modified invention discloses the claimed invention but does not disclose expressly the claimed voltage ranges. It would have been an obvious matter of design choice to a person of ordinary skill in the art to modify the voltage converter as taught by Kotowski with the claimed ranges because applicant has not disclosed that these ranges provide an advantage, are used for a particular purpose, or solve a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the voltage converter as taught by Kotowski because both devices efficiently convert an input voltage to an output operational voltage. Therefore, it would have been an obvious matter of design choice to modify Kotowski's invention to obtain the invention as specified in the claims.

In regards to claims 66-69 Kotowski's modified invention discloses the claimed invention but does not disclose expressly the comparator that compares the level of the battery voltage to the threshold voltage. It would have been an obvious matter of design choice to a person of ordinary skill in the art to modify the comparator for comparing the output voltage to a threshold as taught by Kotowski with the comparator for comparing the input voltage with a threshold because applicant has not disclosed that a comparator on the input provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with the comparator as taught by Kotowski because both configurations determine the suitability of a gain setting for

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pulse-skipping inhibition. Therefore, it would have been an obvious matter of design choice to modify Kotowski's invention to obtain the invention as specified in the claims.

### **(10) Response to Argument**

#### **Rejection of Claims 1-10, 12-27, 29-43, 45-51, and 53-69 as Being Obvious Over Kotowski in View of Lebel**

##### **Claims 1-3, 10, 12, 14-20, 27, 29, 31-37, 43, 45, 47-51, 53, 55-59, and 66-69**

Appellant argued that Kotowski fails to disclose a circuit adapted to inhibit pulse skipping by a boost converter when a level of the battery voltage is greater than a threshold voltage because the battery voltage is only measured to determine the minimum gain, and the output voltage is used to determine the actual gain as described by Kotowski at column 3, line 56 to column 4, line 8. However, the Examiner's position is that both the minimum gain and the actual gain are at least based on the battery voltage and adjusted "when a level of the battery voltage is greater than a threshold voltage." The claim language does not require actual measurement of the battery voltage, but only pulse skipping to be inhibited "when" a level of the battery voltage is greater than a threshold. Although the Examiner concedes that Figure 3 of Kotowski shows the comparator for gain switching to be element 360 on the output side of the circuit, the voltage measured at this point is directly proportional to the input (battery) voltage as the output voltage is the input voltage multiplied by the gain. Regardless of whether the battery voltage itself is measured to adjust the gain, this output voltage is high "when" the battery voltage is high and low "when" the battery voltage is low. So

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even though the gain is adjusted by measuring the output voltage, the gain is adjusted "when a level of the battery voltage is greater than a threshold voltage."

Appellant further argued that Kotowski's invention lacks a threshold voltage, but instead adjusts the gain based on a certain number of skipped clock pulses and is unrelated to the battery voltage. The Examiner maintains the broad reading of "threshold" in the claim language to not require a preset or even constant threshold. The claim language does not preclude the threshold from changing with each clock pulse. As such, Kotowski's system skips a pulse when the output exceeds the threshold defined by element 370 in Figure 3, but this output is directly proportional to the input voltage as described above. Although Kotowski may or may not define a preset and calculated threshold as such, a skip signal is provided when the battery voltage exceeds a threshold such that the battery voltage multiplied by the gain exceeds the value set by element 370. Again, the claim language does not require actual measurement of the battery voltage.

Appellant also argued that modification of the gain setting does not necessarily inhibit pulse skipping because the gain could reach the minimum gain, where the gain cannot be further reduced, and that the circuit could continue skipping pulses even after a gain is reduced. The Examiner's position is that a fair reading of "inhibit" does not require complete prohibition or arresting of pulse skipping, but merely reducing the likelihood or restraining in some way. Accordingly, the Examiner maintains that decreasing the gain when a certain number of "skip" signals has been indicated (based on a "high" battery level as elaborated above) "inhibits" pulse skipping because pulse

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skipping under the decreased gain is less likely than pulse skipping with the previous, higher gain. Again, the Examiner is considering "inhibit" to not necessarily require complete prohibition or arresting of pulse-skipping.

**Claims 60, 62, and 64**

Appellant argued that Kotowski fails to disclose inhibiting pulse skipping by limiting the level of the battery voltage applied to the boost converter, and that limiting the level of the battery voltage applied within the boost converter is not a fair reading of the claim limitation. However, the Examiner maintains that the capacitor array 310 of Kotowski limits the level of the battery voltage applied to, *e.g.*, the *output* of the boost converter. See Figure 4.

**Claims 13, 30, 46, and 54**

Appellant argued that fails to disclose inhibiting pulse skipping by limiting the level of the battery voltage applied to the boost converter, and that limiting the level of the battery voltage applied within the boost converter is not a fair reading of the claim limitation. However, the Examiner maintains that the capacitor array 310 of Kotowski limits the level of the battery voltage applied to, *e.g.*, the *output* of the boost converter. See Figure 4.

**Claims 4, 21, 38, 63, and 65**

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Appellant argued that Kotoski fails to disclose or suggest a transistor that transmits the battery voltage to the boost converter when the transistor is on and the transistor turns off when the battery voltage exceeds the threshold voltage. As indicated above, the switched capacitor array of Figures 4 and 5 modifies the gain based on battery voltage. This gain is modified by turning transistors on and off (col. 8, lines 1-12). For instance, increasing the gain from the configuration in Fig. 6E to the configuration in Fig. 6F entails turning transistors S5 and S7 from “on” to “off.”

#### **Dependent Claims 6-9, 23-26, and 39-42**

Appellant argued that Kotowski fails to disclose transmitting a voltage minus a diode drop or the particular transistor configurations required by claims 6-9, 23-26, and 39-42. However, Kotowski discloses that the capacitor array is switched with transistors. It is well known in the art that transistor switches have a diode drop and it is further known in the art to provide the claimed transistor configurations for switching applications, such as Kotowski's, to provide the predictable result of solid-state switching with off-the-shelf parts.

#### **Claims 5, 22, and 61**

Appellant argued that Kotowski fails to disclose a comparator to compare the battery voltage to the threshold voltage to turn a transistor on or off based on the comparison. However, the Examiner maintains that this modification would have been obvious as switching a transistor on and off with a comparator to modify a gain is known

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in the art (as taught by Kotoswki), as is modifying a gain based on battery voltage (also taught by Kotowski, although to set the “minimum gain”).

### **Claims 66-69**

Appellant argued that the “design choice” rationale relied upon for the rejection of the above claims was impermissible because this basis relies upon “rearrangement of parts,” which is not present in this case. However, the Examiner respectfully contends that an obvious rearrangement of parts is precisely what this modification would be. For instance, the proposed “design choice” modification is applying the input to comparator 360 to “Vi” instead of “Vo.” As the input and output voltage share a linear relationship scaled by the gain value, the Examiner maintains that it would have been an obvious expedient to an artisan of ordinary skill to measure either of these values interchangeably for setting the gain.

### **(11) Related Proceeding(s) Appendix**

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/Michael Kahelin/

Examiner, Art Unit 3762

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